*DIG stands for Digitally Integrated Guide

DIG* National Parks: Scientists in Alaska's Scenery

By Elizabeth O'Connell

Abstract

The DIG National Parks: Scientists in Alaska's Scenery project (DIG) aims to connect the general public with meaningful scientific research, and to pilot informal inquiry-based learning through use of digital media on video enabled devices. DIG will encourage youth, diverse audiences and the general public to co template cutting edge research, where the truth may not be certain, along with the process of research. By working closely with scientists, the national parks in Alaska, the University of Alaska Museum of the North, and the Univeristy of Alaska Fairbanks Arctic Region Super-computing Center, research science will be viewed on mobile devices, the web, broadcast on television or incorporated into museum exhibits. Planned national promotion with "Science Friday" and partners will highlight playing of the video podcasts, called vodcasts, before, during and after a park visit.

Introduction

The DIG project, to produce more than 32 vodcasts, has been proposed to the Informal Science Division of the National Science Foundation (NSF). The intended audience of visitors to the national parks in Alaska ranges from high school age to 90. Only 6% of visitors are under 18 years old, while the average age of the rest of the visitors is 51.6 years old and trending older (*Meldrum 2006*). The challenge is to introduce park visitors to the scientific research conducted in the parks and to spark interest in young people who have been increasingly disconnected from nature (*Louv 2005*).

An important question to undertake before launching this effort is to understand how visitors to national parks understand, think about, and connect with the research conducted in these areas. A review of the literature reveals some sources. For instance, in one front end study by Selinda Research Associates in Yellowstone National Park, they found that visitors to the park "either knew about scientists working in the park or assumed they had to be somewhere, behind-the-scenery, doing their work" (*Gyllenhaal 2002*). Yet, "the respondents seemed less knowledgeable of the role that science plays in wildlife conservation and park management."

Some Findings

Most studies conducted in national parks only addressed visitors' likes/dislikes of interpretive messages, effective signage and ratings of exhibits at the visitor centers, not whether they understood science research going on in the parks. This belies the fact that scientists have been conducting research in the parks since the first national park designation in 1916. For example in 2007, there were over 4,700 permits approved for research conducted in national parks, up from the 2,700 permits issued in 2001 (*Bill Commins, personal communication 2008*). There is some research in this area that has been conducted in museums. The 1995 Field Museum of Chicago study, The Exploration Zone at the Field Museum by Selinda Research Associates examined visitors' understandings of science research (*Perry and Forland 1995*). Of interest are the findings concluding that visitors: seemed to think about what goes on behind-the-scenes primarily in terms of exhibits rather than scientific research; were rated 0 to 2, of a possible 7, in understanding scientific research; were particularly confused by scientific and museum terminology; and had varying amounts of interest in science in their personal lives but indicated a number of possible connections with stories about the scientists.

So even though scientific literacy among citizens has only slightly risen to 20% in the U.S. population over the past decade (*Miller 2004*), the general public is interested in knowing more about science. An NSF study from 2001-2006 indicated that 83-87% of Americans said they had "a lot" or "some" interest in new scientific discoveries. Three out of five Americans said they visited an informal science institution such as a zoo or museum in 2006. To learn about specific scientific issues more than half of Americans choose the internet as an information source (*National Science Board 2004*). The internet ranks second to television as a source for information about science and technology.

In order to appeal to the publics' interest, we intend to present vodcasts about scientific research in parks that will reach an expanded age range, touch diverse audiences and encourage use of vodcasts before, after and during a visit to a park. The vodcast platform will naturally expand the age range of visitors to national parks in Alaska. A natural expansion will occur because mobile devices are a youthful technology that interests a wide age-range of the population.

The goal for this broad public audience, from high school age youth to senior adults, is to move the visitor farther around the learning cycle. In the book *Finding Significance* Sue Allen described the process a visitor goes through when attending the Exploratorium, in San Francisco (*Allen 2004*). We have modified the simple learning cycle (*Figure 2*) to explain how a national park visitor may interact with science oriented vodcasts.

Focus on Climate Change

Alaska, October 2008: a person from the U.S. Coast Guard had just traveled on a Canadian ice breaker from Northern Canada to Dutch Harbor, Alaska. She said there was no ice on her journey. She was amazed to see this graphic (*Figure 3*) showing sea ice thickness by Dr. Wieslaw Maslowski (*Maslowski 2008*).

A visitor to national parks in Alaska is surrounded by the effects of climate change. Will he/she notice? *We can't experience climate directly. The climate we perceive is a metaphor for the sum of weather conditions. Ecosystems describe climate zones by where they grow. Weather statistics define climate using mathematical averages at particular spots. Subsistence hunters know climate through their experience of their home country.* (*Wohlforth 2004*).

During the planning for the project, the project and evaluation teams will work together to develop a carefully articulated "Big Idea" centered around climate change that will be incorporated into each of the vodcast scripts (*Serrell 1996*). Primarily the vodcasts will deepen the public understanding of climate change research in Alaska national parks, get the public to think about the importance of each different area of research, and how it may affect them. Below are four primary outcome objectives.

Knowledge/Attitude: Viewers will become aware of, and gain a deeper understanding of and appreciation for the range of scientists' work that is being conducted in national parks across the country, and in the Alaska national parks in particular.

Knowledge/Attitude: Viewers will develop a greater understanding of and appreciation for the effects of climate change, as it is evidenced in the Polar Regions and in their local communities around the country.

Knowledge/Interest: Viewers will become aware of, interested in, and curious about an area of climate-change scientific research that is highlighted in a vodcast.

Attitude/Skill: Viewers will develop a greater appreciation for and become more skilled at using cell phone technology and other mobile viewing devices in outdoor settings.

NPS photograph by Joshua Foreman

A Podcast is a Story Poem

DIG intends to encapsulate a scientist's research into a "story" of 2-10 minutes. NOVA producer Nancy Linde described three important elements in creating the perfect Nova as "Story, Story and Story" (*Linde 2004*). Imagine that a poem is a podcast as prose is a documentary. We are guided by Robert Frost's take on storytelling. He explains from these excerpts in his essay "The Figure a Poem Makes" (*Frost 1965*).

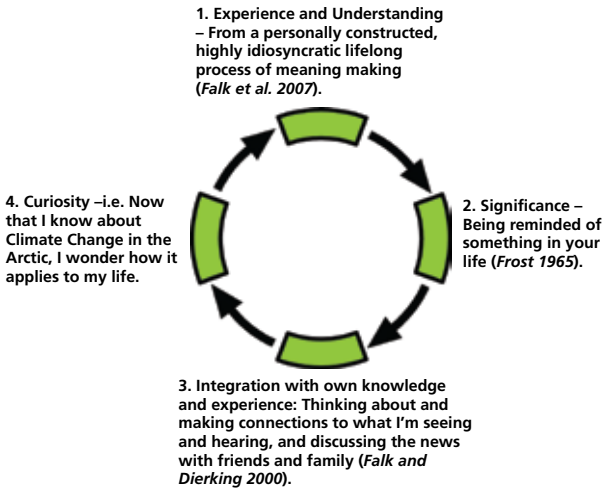
It begins in delight and ends in wisdom. … It has denouement. It has an outcome that though unforeseen was predestined from the first image… No surprise for the writer, no surprise for the reader. For me the initial delight is in the surprise of remembering something I didn't know I knew.

The science vodcasts will be a documentary poem crafted to entertain, stimulate and enlighten the tourist with a "story" about the scientist's research. If a tourist is sparked by a scientist's "story" they will make personal connections and be motivated to further participation and social interplay via on-line science networks.

The scientist's work will be deconstructed (*Figure 4*). It would be difficult to cover a scientist's work in one vodcast. There will be several vodcasts about one scientist's work. Each vodcast will focus on a specific aspect of their work. Or, a series of vodcasts will follow a scientist's work over the duration of the project to emphasize the ongoing aspect of research. During the vodcast we'll get to know the personality of the scientist. We will pair the scientist with an intern, a park visitor, or native who will ask the questions that any park visitor might ask. The vodcasts will be scripted in advance with the scientist. We want to structure for STEM (science, technology, engineering and math) content and anticipate visuals. However, spontaneous and natural interchanges will be incorporated when appropriate. Each vodcast will contain a Google map locating the area of the research (*Figure 4*).

Figure 1. Exit Glacier

Figure 2. Learning Cycle.



DIG's Team and Collaborations

A project of this scope and complexity in the national parks of Alaska can only be accomplished through the collaboration of the NPS and with professional expertise in science, technology, engineering, math and the arts. The Co- Principal Investigators are: Dr. Robert A. Winfree, science professional for the NPS, Alaska Regional Office; Christie Anastasia, education coordinator for the Murie Science and Learning Center, Denali National Park and Preserve; Elizabeth O'Connell, director, WonderVisions; Laura Conner, education director, Museum of the North; and Dr. Gregory B. Newby, chief scientist for the Arctic Region Supercomputing Center, University of Alaska Fairbanks. Many others, scientists, Alaska Natives, authors, education specialists, and tourism experts have pledged support and participation to DIG.

To succeed in achieving its goals DIG has fostered several significant partnerships with organizations that can contribute to the development, creation, implementation and promotion of the project. Science Friday is a 19 year old nationally recognized radio science series hosted by Ira Flatow. Ira's audio podcasts have reached a new peak of 250,000 downloads per program. Flora Lichtman, who creates video content for sciencefriday.com and curates third party videos, will join a scientist in Alaska and produce a vodcast to be featured as a "Pick of the Week".

The University of Alaska Museum of the North (UAMN) is the premier repository for artifacts and specimens collected in Alaska and a leader in northern natural and cultural history research. The UAMN faculty research taking place in Alaska national parks will be highlighted in a number of vodcasts available on our website, the UAMN website and on-site in UAMN exhibition galleries. UAMN will also hire a student production assistant to produce vodcasts with Laura Conner, director of education at the museum.

Our Web 2.0 effort will be strengthened by collaborations with museums in Alaska and across the country such as: the Alutiiq Museum and Archaeological Repository, Kodiak; Pratt Museum, Homer; Science Museum of Minnesota, St. Paul; Museum of Nature & Science, Dallas; and the Museum of Life and Science in Durham, North Carolina.

Critically important to DIG is our Alaska Native participants who will voice oral traditions and life experience that will add longevity and cultural meaning to the vodcasts. They are: Sven D. Haakanson, Jr., Old Harbor Alutiiq, anthropologist, carver, executive director of the Alutiiq Museum; Ronald Brower, Sr., Barrow Inupiaq, artist, Alaska Native Language Center teacher and translator; Kenneth J. Grant, Hoonah Tlingit, management assistant at Glacier Bay National Park and Preserve; Samuel S. Demientieff, Holy Cross Athabascan, River Journeys of Alaska, past executive of Native associations; and Nick Tanape and James Kvasnikoff, Nanwalek Alutiiq, tribal leaders.

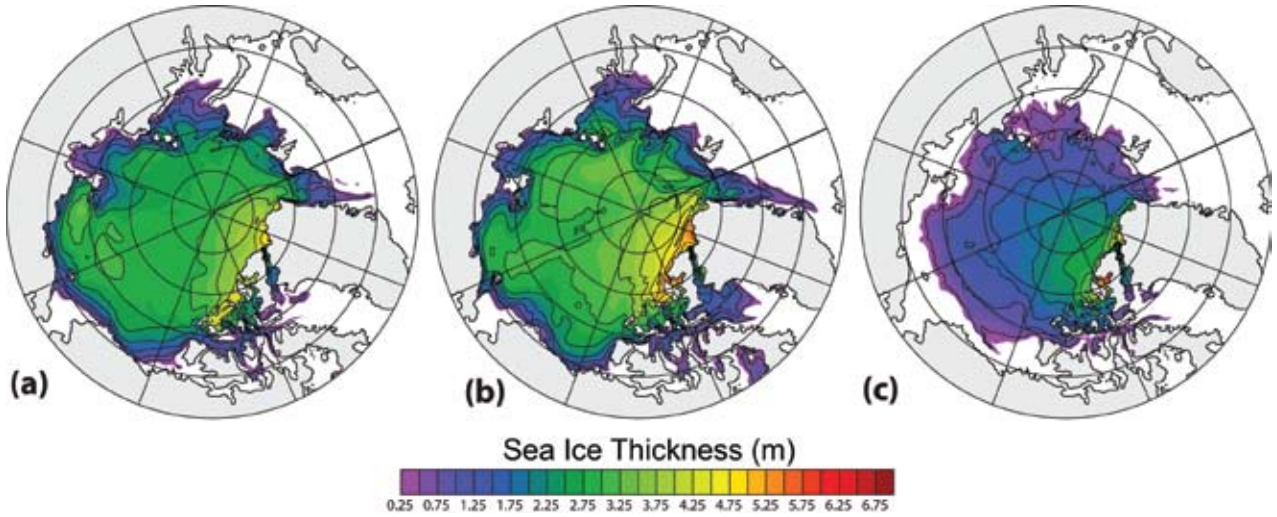


Figure 3. Arctic sea ice thickness (in meters) distribution simulated by Naval Postgraduate School Model.

Kenai Fjords National Park… Menu for Archeologist, Aron Crowell

I can qayaq or baidarka can you qayaq or baidarka?
6 minutes

Dig a Dig
4 minutes

A CMT is What?
2 minutes

If I had an adze
7 minutes

I feel the earth move, YIKES!
2 minutes

When the tide is out the table is set
3.5 minutes

Bead by Bead
5 minutes

Figure 4. Menu example for podcasts in Kenai Fjords National Park.

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